Washington Department of Fish & Wildlife's Priority Habitat and Species Management Recommendations Volume IV: Birds

Sharp-tailed Grouse
Tympanuchus phasianellus

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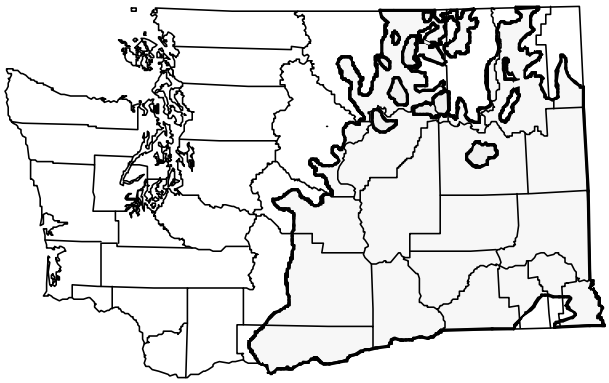
GENERAL RANGE AND WASHINGTON DISTRIBUTION

Sharp-tailed grouse (*Tympanuchus phasianellus*) were originally found throughout substantial portions of central and western North America, including a large portion of Canada and Alaska (Hays et al. 1998). Although there are 6 subspecies of sharp-tailed grouse in North America, only the Columbian subspecies (*T. p. columbianus*) is found in Washington. Columbian sharp-tailed grouse were originally distributed in shrub-steppe, steppe, and meadow-steppe habitats from southern British Columbia, through northeastern California, Utah, Colorado, Wyoming and western Montana (Yocom 1952, Jewett et al. 1953, Aldrich and Duvall 1955, Aldrich 1963, Daubenmire 1970).



Current (dark) and pre-settlement (light) range of the sharp-tailed grouse, *Tympanuchus phasianellus*, in Washington. Map derived from Schroeder et al. 2000.

The current range of sharp-tailed grouse in Washington is restricted to eight small, isolated populations in the north-central portion of the state (Washington Department of Fish and Wildlife 1995, Hays et al. 1998, Schroeder et al. 2000). The largest of these remaining populations is near the Swanson Lakes Wildlife Area in Lincoln County, Nespelem in Okanogan County, and the Tunk-Siwash valleys in the Okanogan River valley (Schroeder et al. 2000). Sporadic sightings outside these primary distribution areas have been reported in Lincoln, Douglas, Okanogan and Asotin counties (Schroeder et al. 2000). Sharp-tailed grouse management areas are currently being designated by the Department of Fish and Wildlife that include portions of Okanogan, Lincoln, Douglas, Chelan and Grant counties (Stinson, in preparation; see also Washington Department of Fish and Wildlife 1995).

RATIONALE

The Columbian sharp-tailed grouse was petitioned for federal listing as a threatened or endangered species under the Endangered Species Act, but the petition was rejected by the U.S. Fish and Wildlife Service after it was determined that populations in southeastern Idaho, north-central Utah, and northwestern Colorado were relatively robust (Warren 2000). Although the sharp-tailed grouse is classified as a game species in Washington, hunting was suspended in 1988 (Washington Department of Fish and Wildlife 1995); the grouse is currently listed as a state-threatened species (Hays et al. 1998). The distribution of sharp-tailed grouse in Washington has severely decreased since pre-settlement times due to the conversion of native habitat to cropland and to the degradation and fragmentation of remaining shrub- and grass-dominated habitats (Schroeder et al. 2000). Approximately 76% of Washington's sharp-tailed grouse habitat has been lost to conversion since the late 1800s (Schroeder et al. 2000). Protection and enhancement of remaining habitats is critical to the long-term management and survival of this species in Washington (Washington Department of Fish and Wildlife 1995).

HABITAT REQUIREMENTS

General Vegetation

Sharp-tailed grouse depend on grass-dominated habitats intermixed with patches of deciduous trees and shrubs for food and cover throughout the year (Connelly et al. 1998). In Washington, sharp-tailed grouse were historically associated with shrub-steppe, steppe, and meadow-steppe (hereafter referred to collectively as shrub-steppe), riparian, and mountain shrub habitats (Daubenmire 1970, Zeigler 1979, Giesen and Connelly 1993, Schroeder et al. 2000). Sharp-tailed grouse habitat is characterized by a high diversity and quantity of shrubs including common chokecherry (*Prunus virginiana*), bittercherry (*Prunus emarginata*), water birch (*Betula occidentalis*), serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos* spp.), hawthorn (*Crataegus* spp.), wild rose (*Rosa* spp.), aspen (*Populus tremuloides*), big sagebrush (*Artemisia*

tridentata), three-tipped sagebrush (*Artemisia tripartita*), and antelope bitterbrush (*Purshia tridentata*) (Washington Department of Fish and Wildlife 1995). Herbaceous vegetation often includes bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), arrowleaf balsamroot (*Balsamorhiza sagittata*), lupine (*Lupinus* spp.), yellow salsify (*Tragopogon dubius*), milkvetch (*Astragalus* spp.), and yarrow (*Achillea* spp.) (Jones 1966, Zeigler 1979, Oedekoven 1985, Marks and Marks 1988, Meints 1991, Washington Department of Fish and Wildlife 1995).

Breeding Display Grounds (leks)

During spring, males congregate on display sites (leks) to breed with females (Connelly et al. 1998). Leks are typically located on knolls and ridges with relatively sparse vegetation (Hart et al. 1952, Rogers 1969, Oedekoven 1985). Leks are typically surrounded by nesting habitat, often outward from the lek to a distance of about 2 km (1.2 mi) (Marks and Marks 1988, Giesen and Connelly 1993). There is no evidence that lek habitat is limiting, especially because males have been observed displaying on a variety of sites that comprise a range of plant conditions (e.g., croplands, roads, native rangelands grazed by livestock) (Hays et al. 1998).

Nesting and Brood Rearing

Sharp-tailed grouse are ground nesters, preferring relatively dense cover provided by clumps of shrubs, grasses and/or forbs (Ammann 1963, Hillman and Jackson 1973, Meints et al. 1992). Residual grasses and forbs from the previous year's growth are particularly important for concealment and protection of nests and broods (Hart et al. 1952, Parker 1970, Zeigler 1979, Oedekoven 1985, Meints et al. 1992, Giesen and Connelly 1993, Hays et al. 1998). In research studies, visual obstruction readings (VOR; i.e., quantitative measure of vertical plant cover) were found to be greater at nest sites than at random sites (Kobriger 1980, Marks and Marks 1987, Meints 1991, McDonald 1998).

In Washington, McDonald (1998) found that litter cover, bare ground, and visual obstruction differed between nest and random sites within 5 meters of nests. Litter cover and visual obstruction were significantly greater at nest sites, while bare ground was significantly less at nest sites. McDonald (1998) found VOR readings of 24 cm within 5 meters of all nests, and successful nest sites had higher VOR readings than unsuccessful nests (28 cm vs. 23 cm). In addition, litter cover at successful nest sites was greater than 80 percent.

Fields enrolled in agricultural set-aside programs (e.g., federal Conservation Reserve Program [CRP]) are often used by nesting grouse (Sirotnak et al. 1991, McDonald 1998, Schroeder et al. 2000). After eggs hatch, hens with broods move to areas where succulent vegetation and insects can be found (Hamerstrom 1963, Bernhoft 1967, Sisson 1970, Gregg 1987, Marks and Marks 1987, Klott and Lindzey 1990). In late summer, riparian areas and mountain-shrub communities are preferred (Giesen 1987).

Winter

Throughout winter, patches of deciduous trees and shrubs in upland and riparian areas provide food and protective cover (Zeigler 1979, Oedekoven 1985, Marks and Marks 1988, Meints 1991, Giesen and Connelly 1993). Although sharp-tailed grouse will feed on cultivated grain crops in Washington, deciduous shrubs and trees (e.g., water birch) appear to be critical when snow conditions are such that access to wheat is restricted (Zeigler 1979).

Food

Food items consumed by sharp-tailed grouse in spring and summer include wild sunflower (*Helianthus* spp.), common chokecherry, sagebrush, serviceberry, salsify, dandelion (*Taraxacum* spp.), bluegrass (*Poa* spp.), and brome (*Bromus* spp.) (Marshall and Jensen 1937, Hart et al. 1952, Jones 1966, Parker 1970). Although juvenile and adult grouse consume insects, chicks consume the greatest quantity of insects during the first few weeks of life (Parker 1970). The fruits, seeds, and buds of deciduous trees and shrubs (e.g., chokecherry, serviceberry, snowberry, wild rose, hawthorn, aspen, and water birch) and wheat and corn where available, are consumed throughout the winter (Marshall and Jensen 1937, Buss and Dziedzic 1955, Marks and Marks 1988, Giesen and Connelly 1993).

LIMITING FACTORS

The conversion of native shrub-steppe habitat to cropland over most of the pre-settlement range of sharp-tailed grouse is the primary cause of long-term population declines (Buss and Dziedzic 1955, Hays et al. 1998, Schroeder et al. 2000). Grassland habitat has decreased from 25% of the eastern Washington landscape to 1%, while shrub-steppe has decreased from 44% to 16% (McDonald and Reese 1998). Remaining areas of suitable habitat are relatively small and highly fragmented. Within the currently occupied range of sharp-tailed grouse, the degradation, removal and fragmentation of winter habitat appears to be the most significant limiting factor (Hays et al. 1998). Specific management concerns include grazing, removal of native shrubs and trees in riparian and mountain shrub communities, urban development, orchard development, fire, and permanent flooding of historic wintering habitat by dams along the Columbia River system (Oedekoven 1985, Giesen 1987, Marks and Marks 1987, Washington Department of Fish and Wildlife 1995, Connelly et al. 1998, Schroeder et al. 2000).

MANAGEMENT RECOMMENDATIONS

Conversion of Shrub-Steppe

Most of the remaining shrub-steppe habitats are characterized by relatively shallow soil; hence, they are usually undesirable for crop production (Dobler et al. 1996, Jacobson and Snyder 2000, Vander Haegen et al. 2001). Nevertheless, additional conversion of shrub-steppe habitat for development and/or crop production within sharp-tailed grouse management areas should be discouraged (Washington Department of Fish and Wildlife 1995). The retention of remaining shrub-steppe in Douglas, Lincoln and Okanogan counties is especially important (Washington Department of Fish and Wildlife 1995).

Vegetation Removal

Vegetation removal should be discouraged within 2 km (1.2 mi) of active or potential lek sites, especially during the breeding season (Giesen and Connelly 1993, Washington Department of Fish and Wildlife 1995). In some cases, limited sagebrush treatment that improves the productivity and diversity of desirable grasses, forbs, and shrubs, with careful pre-treatment assessment and post-treatment management, might be considered (Washington Department of Fish and Wildlife 1995). Deciduous shrubs and trees in sharp-tailed grouse habitat should be retained (Giesen and Connelly 1993). In addition, manipulation of vegetation that reduces or disturbs riparian habitats should not occur within 100 m (328 ft) of streams, including dry and intermittent streams (Giesen and Connelly 1993, Washington Department of Fish and Wildlife 1995). Vegetative cover should be maintained at a visual obstruction reading of 24 cm (9.5 in) within nesting habitat (McDonald 1998).

Fire

Controlled burning should not be considered for any type of sharp-tailed grouse habitat unless the action is part of a carefully considered overall plan to restore shrub-steppe habitat and the likelihood of beneficial results for the species is high (Washington Department of Fish and Wildlife 1995). Any fire plan should carefully consider the potential spread of weeds and exotic annuals, loss of sagebrush, response of existing vegetation to different fire intensities and seasons, and the conditions of adjacent lands (Washington Department of Fish and Wildlife 1995). Fire can be used to improve grassland habitat and control invasion by conifer species (Giesen and Connelly 1993, Hays et al. 1998). Livestock control following planned burns and wildfires is essential to permit the establishment of native shrubs and herbaceous vegetation (Brown 2000). Because the availability of critical wintering habitat is likely the most significant limiting influence on sharp-tailed grouse (Washington Department of Fish and Wildlife 1995), any burning conducted in wintering habitat should be done with extreme caution as a means to restore habitat, and only very small portions of wintering habitat should be burned during any given season.

Grazing and Browsing

Large herbivores (wild and domestic) can significantly influence and alter plant community composition and structure to varying degrees among different ecosystems (Daubenmire 1940, Augustine and McNaughton 1998, Opperman and Merenlender 2000). The forbs and bunchgrasses native to shrub-steppe in Washington are most likely not adapted to severe grazing because large grazing animals were presumably not present in large numbers for several thousand years prior to the introduction of domestic livestock (Mack and Thompson 1982, Lyman and Wolverton 2002).

Over-grazing (i.e., repeated grazing that exceeds the recovery capacity of the vegetation and creates or perpetuates a deteriorated plant community) is often detrimental to sharp-tailed grouse habitat (Yocom 1952, Sisson 1970, Zeigler 1979, Klott and Lindzey 1990, Giesen and Connelly 1993, Washington Department of Fish and Wildlife 1995). Management for sharp-tailed grouse habitat should be conducted to establish a relatively lush composition of perennial bunchgrasses and forbs (McDonald 1998), and grazing management should maintain habitat in good to excellent ecological condition as defined by the Natural Resources Conservation Services technical guidelines (Ulliman et al. 1998). In shrub-steppe habitats, it is difficult to provide acceptable levels of visual obstruction in nesting and brood-rearing habitats with more than light grazing (Sisson 1976, McDonald 1998). Consequently, light grazing (25% removal of annual herbaceous growth; [Holechek et al. 1999, Galt et al. 2000]) or no grazing may by necessary for habitat improvement (McDonald 1998). It is especially important that these levels of grazing not be exceeded in areas where habitat restoration is the objective (Galt et al. 2000), during drought years (Holechek et al. 2003), and/or following fires (Brown 2000).

Light grazing combined with rest rotation on a yearly basis may be compatible with sharp-tailed grouse management (Giesen and Connelly 1993). No grazing may be necessary where the habitat has been previously degraded and habitat restoration is the goal (Kirsch et al. 1973, McDonald 1998). Cattle can also harm nests through trampling (McDonald 1998). McDonald (1998) recommends deferring grazing until July (after the nesting season) in sharp-tailed grouse habitat in Washington. Livestock use of riparian areas should be managed or eliminated to minimize the loss of associated shrubs and trees (Giesen and Connelly 1993, Paulson 1996). Grazing is discouraged in areas where encroachment by noxious weeds is a problem. If necessary, wildlife resource agencies may consider means of reducing the impacts of wild ungulates on grouse habitat that might include the alteration of supplemental feeding programs, adjustments to hunting regulations, and temporary fencing.

Biological soil crusts are a common feature of many shrub-steppe plant communities, particularly in the lowest precipitation zones (Belnap et al. 2001). Biological crusts are comprised of lichens, mosses, cyanobacteria, green algae, microfungi, and other bacteria that might indirectly benefit grouse through aiding nitrogen fixation of plants, increasing the nutrient value of plants, increasing native plant germination rates, and by inhibiting the expansion of

exotic species including cheatgrass (Belnap et al. 2001; J. Belnap, personal communication). These organisms form a living soil crust that is easily damaged by grazing (Daubenmire 1940, Mack and Thompson 1982, Belnap et al. 2001). Belnap et al. (2001) describes grazing practices that can help reduce damage to biological soil crusts. Although most soil crust studies were conducted in more arid environments, precipitation levels in some of these studies rival the drier areas of eastern Washington. Research is needed to fully understand the ecological function, impacts of disturbance, and the means to reduce impacts to biological crusts in eastern Washington's shrub-steppe.

Chemical Treatments

Herbicides and insecticides may negatively affect sharp-tailed grouse habitat by removing forbs and deciduous shrubs used for cover and by eliminating insects used for food (Oedekoven 1985, Hays et al. 1998). Land managers should be encouraged to use integrated pest management that targets specific pests or noxious weeds, to use pest population thresholds to determine when to use pesticides or herbicides, and to use crop rotation/diversity and beneficial insects to control pests (Stinson and Bromley 1991). For more information on alternatives such as integrated pest management, contact the county Washington State University Cooperative Extension Service or the USDA Natural Resource Conservation Service.

Human Disturbance

All mechanical, physical and audible disturbances should be avoided during the breeding season (March through June) within 2 km (1.2 mi) of active lek sites (Giesen and Connelly 1993). Wind turbines should not be located in habitat known to be occupied by sharp-tailed grouse because this species avoids vertical structures and is sensitive to habitat fragmentation (U.S. Fish and Wildlife Service 2003). In known grouse habitat, avoid placing turbines within 8 km (5 mi) of known leks (U.S. Fish and Wildlife Service 2003). Viewing and censusing sharp-tailed grouse leks should be conducted in a way that minimizes disturbance of birds. If public interest in viewing leks is high, agencies should consider providing and supervising viewing opportunities, perhaps with specific viewing blinds. If public use appears to be impacting breeding behavior, closures and/or timing restrictions may be necessary on public lands.

Predation

Predator management should include the use of facilities that minimize perching by raptors (e.g., perch guards; Bureau of Land Management et al. 2000), removal of artificial nest sites for predators such as the common raven (*Corvus corax*), and control of dumps and/or livestock feeding stations that may concentrate and/or enhance predator populations (Washington Department of Fish and Wildlife 1995). Raptor-proofing techniques might include placing power-lines underground, covering horizontal surfaces (e.g., ledges) and other structures with steeply angled slanting boards or sheets metal, or placing low-voltage, electrically charged wires

over perching structures. Because sharp-tailed grouse rely on grass and shrub cover for concealment from predators, activities that reduce tall residual grass and shrubs, especially in nesting areas, should be avoided (Giesen and Connelly 1993). In general, management that retains or produces good quality grouse habitat should be used as the most cost-effective tool for minimizing the negative effects of predation (Schroeder and Baydack 2001).

Conservation and Restoration

Research has shown that sharp-tailed grouse depend on deciduous trees/shrubs for winter food and that the lack of winter habitat may be a limiting factor in some areas (Marks and Marks 1988, Giesen and Connelly 1993, Schroeder et al. 2000). Therefore, planting appropriate vegetation in suitable sites (e.g., along streams, draws, or springs), preferably within 6.5 km (4 mi) of actual or potential breeding habitat (Meints et al. 1992) should occur in areas marked for conservation or restoration. These considerations should be included in the guidelines for future agricultural set-aside and/or conservation programs (such as CRP). Recommended deciduous shrub and tree species include water birch, aspen, chokecherry, hawthorn, snowberry and serviceberry (Washington Department of Fish and Wildlife 1995). Management practices to rejuvenate or increase mountain shrub communities within breeding complexes should be restricted to 25% of this cover type annually. Shrub-steppe restoration and enhancement in areas where this native habitat has been removed (e.g., croplands) or degraded may benefit sharp-tailed grouse (Washington Department of Fish and Wildlife 1995). Restoration would include seeding with a combination of native shrubs, perennial forbs and bunchgrasses. Land management should also include the control of noxious weeds that compete with native vegetation.

Agricultural set-aside programs (such as the Conservation Reserve Program, Grassland Reserve Program) in sharp-tailed grouse areas should be supported (Washington Department of Fish and Wildlife 1995). The set aside programs should be structured to promote growth of a diversity of perennial bunch grasses and forbs, annual retention of residual cover, and restoration of deciduous shrubs (Hays et al. 1998, Boisvert 2002). The use of species of limited habitat value like smooth brome (*Bromopsis inermis*) and intermediate/pubescent wheatgrass (*Thinopyrum intermedium*) should be discouraged (Boisvert 2002, A. Sands personal communication).

Local and regional government programs should be reviewed to ensure they address long-term conservation of sharp-tailed grouse populations and habitat. Specifically, critical areas protection that falls under Washington's Growth Management Act are intended to protect State Threatened, Endangered and Sensitive species and can be an effective conservation tool. Local development regulations could require mitigation standards and provide incentives to reduce impacts from projects that potentially affect sharp-tailed grouse habitat. Many resource agencies, including Washington Department of Fish and Wildlife, have staff that can provide assistance in critical areas planning.

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KEY POINTS

Habitat Requirements

- Sharp-tailed grouse occupy a variety of habitats in eastern Washington, including steppe, meadow-steppe, shrub-steppe, riparian, and mountain shrub.
- Buds, seeds, and fruits of chokecherry, serviceberry, snowberry, wild rose, hawthorn, aspen, and water birch are important winter food species for sharp-tailed grouse.
- Residual perennial bunchgrasses and forbs are the preferred nesting habitat of sharp-tailed grouse. Residual herbaceous growth from the previous growing season is a necessary component of sharp-tailed grouse nesting habitat.
- Sharp-tailed grouse depend on grass-dominated habitats intermixed with patches of deciduous trees and shrubs for food and cover throughout the year.

Management Recommendations

- Vegetation manipulation should be avoided (herbicide application, burning, mechanical treatment) for reasons other than sharp-tailed grouse habitat improvement within 2 km (1.2 mi) of active or potential lek sites, within 100 m (328 ft) of streams, or within winter habitat.

- Conversion of shrub-steppe habitat should be avoided within sharp-tailed grouse management areas.

- Vegetative cover should be maintained at a visual obstruction reading of 24 cm (9.5 in) within nesting habitat.

- Controlled burning should be avoided within any type of sharp-tailed grouse habitat unless the action is part of a carefully considered overall plan to restore shrub-steppe habitat and the likelihood of beneficial results for the species is high.

- Grazing management that improves and/or maintains habitat in good to excellent condition should be supported.

- Light grazing levels (≥25% removal of annual herbaceous growth) or cessation of grazing to improve habitat conditions should be maintained.

- Grazing should be managed or eliminated within riparian areas to minimize the loss of associated shrubs and trees.

- Herbicide and insecticide use should be discouraged where sharp-tailed grouse occur, and encourage the use of integrated pest management.

- All physical and audible disturbances should be avoided from March through June within 2 km (1.2 mi) of active lek sites.

- Native shrubs and perennial native forbs and bunchgrasses should be reseeded to restore sharp-tailed grouse habitat.

- Land managers should control noxious weeds and prevent noxious weed encroachment in suitable sharp-tailed grouse habitat.

- The use of agricultural set aside programs (e.g., Conservation Reserve Program, Grassland Reserve Program) should be supported in sharp-tailed grouse areas dominated by cropland.